

CLIMATOLOGICAL DATA FOR SEPTEMBER, 1913.

DISTRICT No. 2, SOUTH ATLANTIC AND EAST GULF STATES.

CHARLES F. VON HERRMANN, District Editor.

GENERAL SUMMARY.

The appearance of an unusual number of areas of low atmospheric pressure on the central west Gulf coast was an important feature of the weather during September, although none of these disturbances developed material force or took the usual northeasterly course up the Atlantic coast line. They were accompanied, however, by enormous amounts of precipitation in the extreme southern portions of the Mississippi area, in Alabama, and in northwestern Florida, and undoubtedly aided in bringing about the decided lowering of the temperature during the last two decades of September by favoring a drift of air from the north. The precipitation for the month ranged from 10 to over 20 inches at numerous stations on the immediate Gulf coast from Bay St. Louis eastward to Apalachicola.

Another noteworthy feature was the small storm that entered North Carolina between Wilmington and Hatteras from the Atlantic Ocean on September 3, which instead of recurring northeastward, drifted slowly westward, passing south of Raleigh, where the pressure fell to 29.37 inches, and degenerating into a general rain area over western North Carolina and Virginia on the 4th. This storm was especially destructive to property in eastern North Carolina.

Although quite warm during the first decade the decidedly cool weather from about the 10th to the 26th brought the monthly mean temperatures below the normal in all portions of the district, the State deficiencies reaching 2.5° in the Carolinas, Georgia, and Alabama, and made the month the coldest September on record in some States. Unusually low temperatures occurred particularly on the 22d and 23d, breaking previous records for low temperature in this month at several stations, and causing light frosts over extended areas in the northern portions of the Gulf States and in central western portions of the Carolinas and Virginia, fortunately without material damage to crops. The month closed with temperatures above normal.

The precipitation was very irregularly distributed. It was above normal in all States in the district except Florida, the deficiency there being due to the moderate rainfall over the peninsula, and the limited area of the very excessive rainfall in the northwest portion. The excess for the month was greatest in Mississippi, Alabama, and the western prolongation of Florida. The least amount fell in the Altamaha Basin in southeastern Georgia and in a series of counties stretching across South Carolina just within the coast line, where the amount was under 2 inches.

The highest atmospheric pressure occurred generally in the northern portions of the district on the 16th, in the southern on the 23d or 24th, with a maximum of 30.49 inches at Richmond and Lynchburg, Va. The lowest pressure occurred on the 21st in the north and on the 14th in the south, but the minimum for the district was 29.37 inches at Raleigh on the 3d.

TEMPERATURE.

Nearly the whole of the first decade of September was quite warm, the highest temperatures for the month which occurred on the 7th or 8th in the northern portions of the district and on the 3d in the Gulf States, ranging from 90° to over 100° . The heat wave was most severe in Alabama and Mississippi, where 14 stations reported maximum temperatures of 100° or above. This period of unusual warmth can hardly hold comparison with the similar period in 1912 when maximum temperatures of 100° or above were registered at 100 stations from Virginia to Mississippi.

About the end of the first decade temperatures declined below normal, and the remaining portion of the month, except the last few days, was cool. Two periods of much colder weather occurred about the 14th to 18th and 21st to 26th, during which the deficiencies in temperature were so marked as to fix the general character of the month as decidedly cold, especially in the Carolinas, Georgia, and Alabama. In South Carolina and Georgia the month was the coldest in 20 years, and in Alabama the coldest since September, 1903. The 22d and 23d were the coldest days throughout the district, and minimum temperatures ranged below 40° in all sections, except Florida, where, however, a minimum of 41° was reported. In the northern portions of Alabama and Georgia and in the western portions of North Carolina and Virginia the lowest temperatures ranged from 33° to 36° , making new records for low temperatures in September at several stations. Light frosts formed over an extensive region in the northern portions of the district as well as in northern Georgia and Alabama, in which States the occurrence of frost so early in the season is extremely rare.

Although the State averages were all below normal, a slight excess was noted at a few individual stations in Florida. The maximum deficiency ranging from 3° to over 4° occurred in the section from central Georgia northeastward to western North Carolina. The highest monthly mean temperature for the district was 81.4° at Key West, Fla., and the lowest was 61.1° at Rock House, N. C. The highest temperature was 103° at Agricultural College, Miss., and the lowest 33° at Hot Springs, Va.

PRECIPITATION.

The comparatively slight disturbance in the Gulf of Mexico on the 5th when the lowest atmospheric pressure reported was 29.85 inches at Burwood and which subsequently remained as an ill-defined depression on the central west Gulf coast for several days, was accompanied by unusually heavy rains at stations near the coast. During 5 days from the 4th to 8th Apalachicola, Fla., received 11.94 inches, Bay St. Louis 5.61 inches, and several other stations large amounts. On the 13th a similar moderate storm appeared on the west Gulf coast, with the pressure 29.8 inches at Galveston, which moved to northern Louisiana, and thence to the central Mississippi Valley

without materially increasing in force, which was also accompanied by unusually heavy rains in the Gulf States. During the 7 days from the 13th to 19th, Apalachicola, Fla., received 9.67 inches, and during 5 days from the 13th to 16th, Mobile, Ala., received 12.60 inches, Robertsdale, Ala., 9.07 inches, and Spring Hill, Ala., 9.92 inches. The amount at Daphne, Ala., on the 13th and 14th was 13.80 inches, and including the 15th 15.55 inches. The greatest 24-hour rainfall was 7.40 inches at Mobile, Ala., on the 13-14th, large 24-hourly rains occurred in every State in the district. In this region of heaviest rainfall the total for the month was 22.87 inches at Apalachicola, Fla., 23.44 inches at Daphne, Ala., 15.50 inches at Mobile, Ala., and 17.96 inches at Bay St. Louis, Miss.

Heavy rains also occurred in eastern North Carolina in connection with the storm of September 3, the average for the eastern district being 6.65 inches.

The least precipitation, amounting to less than 2 inches for the month, occurred over the Altamaha basin in southeastern Georgia and in a series of counties extending from Hampton to Darlington in South Carolina. The smallest total reported was 0.77 inches at Glennville, Ga. In this section of Georgia, as well as in the extreme northwestern portion, severe drought prevailed from August 16 to September 14. Moderate precipitation also fell over most of the main Peninsula of Florida, bringing the average for that State considerably below normal in spite of the very heavy rainfall over its western prolongation. In all other States in the district the State averages were above normal, with maximum excess in the Mississippi area, +5.24 inches.

In the northern portions of the district the rains occurred in fairly distinct periods from the 2d to 5th, 15th to 22d, and 29th to 30th, the number of fair days averaging about 14 during the month. In the southern part there were only 2 periods of dry weather, a very short one about the 12th and from the 22d to 27th, inclusive, the average number of rainy days being 10.

MISCELLANEOUS PHENOMENA.

The prevailing direction of the wind was northeast in all the States from Virginia to Georgia, but more nearly east or southeast in the Gulf States. High wind velocities were reported at many stations on the Atlantic coast, namely Charleston, S. C., 62 miles from the northeast on the 9th, Hatteras 74 miles southeast on the 3d, Norfolk 50 miles east and Cape Henry 52 miles east on the 3d. The average hourly wind velocity exceeded 10 miles an hour at Norfolk, Cape Henry, Hatteras, Charleston, Pensacola, and Sand Key.

The average number of clear days for the district was 12, partly cloudy days 8, and cloudy days 10. The amount of sunshine was generally less than the normal for September, the average of 17 stations giving 221 hours of actual sunshine or 60 per cent of the possible amount. The highest percentage was 73 at Charleston, S. C., and the least 44 at Hatteras, N. C., followed by 47 at Montgomery, Ala.

METEORS.

A number of brilliant meteors were observed during the month in various portions of the district. On the evening of the 4th large meteors were observed at Thomasville, Ga., Pensacola, Fla., and Mobile, and Citronelle, Ala. From the times of appearance and direction of motion it is believed they were the same meteor seen

from different points. It was first observed at Thomasville at 7.10 p.m. at an altitude of 30°, moving westward; the tail or streamer was very bright, many colored, and about 10° long. Mr. F. Rust Smith, who observed it at Pensacola, states that the meteor came from the southeast and passed toward the northwest at 7.14 p.m., being visible for about 1 minute. Its head was apparently about 1 foot in diameter, and the tail about 3 feet long, and emitted a pale blue light from the head and yellow from the streamer. The meteor was still quite brilliant when observed some time later at Mobile and Citronelle, Ala.

A fine meteor was also observed on the evening of September 12 over southeastern Virginia. Mr. Kimball, of the Richmond station, furnished the following abstract from a more complete report made by Mr. C. W. Ashby, cooperative observer at Newport News, Va.

At Newport News the phenomenon first appeared in the zenith of a cloudless, moonlit sky as a meteor of moderate brightness at exactly 7.15 p.m., and disappeared four seconds later in a burst of sparks about 10° above the southeastern horizon. The meteor was roughly speaking rectangular in outline, the rear end being drawn out into a short tail, while the head was enveloped and somewhat obscured by a slight haze. A shower of sparks followed the meteor, but no luminous trail such as often accompanies meteors was observed. In its downward flight a white light was emitted which increased in intensity, taking a greenish tint as the meteor reached its point of greatest brilliancy on the completion of the first 45° of arc. The light then changed to a yellowish red which deepened as the lower end of the path was neared.

The meteor is thought to have been one of unusual size, since the various phases of its flight could readily be seen notwithstanding the fact that the full moon was shining directly in the face of the observer.

On the same date a meteor was reported to have fallen in the Broad River, near Corn Island, S.C., by Mr. L. L. Rice, who observed it from launch about a quarter of a mile distant.

SEVERE LOCAL STORMS.

On September 18, 1913, at 3 p.m., a severe storm with all the characteristics of a tornado visited Conway, Horry County, S. C., causing a loss of about \$3,000.

RIVER CONDITIONS.

The heavy rains in the Gulf States were mostly limited to the lower courses of the rivers and had comparatively little influence on river stages, which remained low throughout most of the month, flood stages not having been attained at any point. In the Carolinas, however, the heavy rains of the 3d and 4th, and again on the 18th and 19th, caused moderate floods for which suitable warnings were issued.

On September 4 warnings were issued by the official at Raleigh for a considerable rise in the rivers of eastern North Carolina. The stages indicated for the Roanoke and Cape Fear Rivers, however, were not above flood stage. The Roanoke at Weldon rose to 26.9 feet on the 6th, and the rise in the Cape Fear River at Fayetteville was from 3 to 24 feet within 24 hours. The overflow of the Tar River was slow and moderate, while that of the Neuse was quick and heavy. On the Tar River flood stages were attained as follows: At Tarboro 20 feet on the 9th (flood stage, 18 feet), at Greenville 15.2 feet on the 10th (flood stage, 13 feet), and in the Neuse River, Neuse reported 18.5 feet on the 4th (flood stage, 12 feet) and Smithfield 19 feet on the 5th (flood stage, 13 feet). The loss to buildings, factories, highways, and bridges was about \$10,000, to crops about \$5,000, and the loss due to suspension of business was also about \$5,000. The money value of the property saved by the warnings was about \$10,000.

General rains of from 1.35 to 2.70 inches over the greater part of the Wateree, Broad, and Saluda watersheds on the 18th and 19th resulted in rises to somewhat above flood stages in the lower Wateree and upper Santee Rivers from the 21st to the 27th, warnings for which were issued during the late afternoon of September 19 by the official at Columbia, S. C. The following stages were attained: At Rimini the water stood above the flood stage from the 21st to 25th, with a crest of 12.9 on September 22 (flood stage, 12 feet).

At Ferguson the river was above flood stage from September 24 to 27, with a crest of 12.6 feet on the 25th (flood stage, 12 feet). The losses were confined to live stock that could not be driven from the swamps, estimated at about \$250. Money value of the property saved by the warnings about \$12,000.

THUNDERSTORM AT CHARLESTON, S. C., SEPTEMBER 9, 1913.

By J. H. SCOTT, Local Forecaster.

A violent thunderstorm, as sudden as it was severe, struck Charleston about 2.55 p. m., September 9, 1913. The forenoon of that day was almost cloudless and the temperature mounted rapidly to 90° at about 2. p. m., notwithstanding the presence of a strong and extensive area of high pressure pushing southeastward from the Lake region. This "high" undoubtedly contributed to the formation of the storm by overrunning the warm surface layers with colder air, and determined the direction of movement. About 2 p. m. a cumulus cloud was observed forming in the northeast, and at 2.20 p. m., while the cloud was as yet comparatively small, thunder was first heard, after which developments were rapid. The cloud grew apace, and following the Wando and Cooper Rivers, bore down on the city, the thunder becoming almost a continuous roar. The writer has witnessed few clouds of such terrifying aspect. The cloud had a distinct greenish hue; its front was torn by violent winds which lashed to foam the waters of the harbor. It struck the city about 2.55 p. m. and by 3.03 p. m. the wind had attained a velocity of 62 miles per hour from the northeast, maintaining this velocity for the succeeding five minutes. Rain began at 2.56 p. m., and from 3.04 to 3.19 was mixed with hail. From 3.07 to 3.14 p. m. the hailstones were particularly large, many being 1½ inches in their longest diameter. By 3.15 p. m. the wind had diminished to ordinary velocities, but a slow rain continued until 5.30 p. m. Just before and during the storm the temperature fell from 90° to 65°.

The storm presented none of the characteristics of a tornado, though its path of greatest violence was rather limited; but little hail fell at the navy yard, 7 miles north, and on Sullivans Island, 5 miles east, there was neither hail nor violent winds. A few miles southwest of the city the storm was reported as mild in character.

Notwithstanding the suddenness and high velocity of the wind, little damage resulted, although a temporary panic prevailed among the passengers of the ferryboat *Lawrence*, which was blown considerably out of her course. Fishermen caught in the harbor saved themselves by lowering their masts and lying beside them flat in the bottom of their small boats until the storm had passed. Two

windows were blown in at the Union Station, and street cars were temporarily tied up on two lines. A box car standing in front of the east entrance to the customhouse had its roof lifted bodily, hurled some 30 feet, and deposited in an inverted position in front of the customhouse.

The maximum wind velocity in this storm has been equaled at this station only once before in September. This occurred September 29, 1896, but in that instance the wind was occasioned by a general storm of the hurricane type.

THE STORM OF SEPTEMBER 8, 1913, IN EASTERN NORTH CAROLINA.

By LEE A. DENSON, Section Director, Raleigh, N. C.

The morning weather map of September 1, 1913, revealed the presence of a disturbance, apparently of very moderate force, central in the Atlantic Ocean about 300 miles southeast of the coast of North Carolina in which the lowest pressure was about 29.9 inches. On the morning of the 2d this storm was evidently approaching the coast, the pressure having fallen to 30.05 inches at Hatteras, with high northeast winds and rain. The center of the disturbance moved inland between Hatteras and Beaufort, N. C., took a westerly course, and passed south of Raleigh about 2 p. m. of the 3d. The barograph trace at this station is of interest in showing the rapidity of the fall and rise of pressure, although the lowest pressure reached was only 29.37 inches at 2.10 p. m. of that date. After leaving the coast section the storm diminished rapidly in intensity and finally spent its force before reaching the mountain region. Over the main portion of the eastern half of the State it was attended by high winds and a rainfall of from 2 to 5 inches, but the rainfall was not heavy after reaching the Cape Fear watershed. Great damage to property and crops resulted over the eastern portion of the State, especially in the Pamlico Sound section, owing to the high waves from the Sound. The highest wind velocity registered was 74 miles from the southeast at Hatteras. At Raleigh the maximum velocity was 37 miles from the northeast, at Wilmington 30 miles from the west, while at Charlotte there was no wind of any consequence.

The greatest loss of property occurred in the vicinity of Washington and Newbern, where the water driven by northeast to southeast gales is reported to have risen 10 feet above previous high-water marks. The bridge of the Norfolk & Southern Railroad at Washington, a mile in length, was washed away, and also a similar bridge at Newbern, and many other small bridges and trestles. The loss by inundation of the lower streets, also to small boats and fishing craft, was very heavy. Telegraph and telephone lines were prostrated or damaged over a wide area. Crops suffered severely, there being considerable damage even as far west as Wake and Durham Counties. At Farmville, N. C., two boys were killed by the collapse of a warehouse, and several people were injured. The total loss of property was probably over \$3,000,000.

In the vicinity of Norfolk, Va., the damage by wind was not great. In the open country telegraph and telephone poles and trees were blown down, and at Ocean View, Newport News, and Old Point, Va., a number of small houses were unroofed. There were no marine disasters in Hampton Roads.

TABLE 1.—*Climatological data for September, 1913. District No. 2—Continued.*

Stations.	Counties.	Elevation, feet.	Length of record, years	Temperature, in degrees Fahrenheit.							Precipitation, in inches.				Sky.				Observers.	
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmeted.	Number of rainy days, 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	Prevailing wind direction.	
<i>Mississippi—Contd.</i>																				
Laurel.....	Jones.....	241	9	74.2	—	100	3	44	22	36	9.42	—	1.68	0	15	13	5	12	se.	Thomas W. Flynt.
Leakesville.....	Greene.....	19	24	75.2	— 2.7	96	2	46	22	36	9.13	+ 4.34	2.10	0	9	—	—	—	—	Dr. Sam Pool.
Louisville.....	Winston.....	561	24	74.6	— 0.4	100	3	44	22	34	8.13	+ 5.43	4.18	0	14	—	—	—	B. T. Webster.	
McNeill.....	Pearl River.....	230	10	75.2	— 2.3	95	3	47	22	30	8.87	+ 2.71	1.93	0	15	7	10	13	se.	Prof. E. B. Ferris.
Macon.....	Noxubee.....	185	25	74.0	— 1.1	102	3	43	22	34	6.47	+ 3.27	1.57	0	11	11	5	14	e.	Flinis E. Carlton.
Magnolia.....	Pike.....	415	17	74.7	— 2.1	97	3	45	22	30	11.14	+ 7.12	2.81	0	18	5	12	13	se.	Miss Ruby V. Roberts.
Meridian.....	Lauderdale.....	375	23	72.9	+ 0.2	98	3	46	22	28	8.52	+ 5.05	2.68	0	16	8	4	20	e.	U. S. Weather Bureau.
Merrill.....	George.....	76	8	—	—	—	—	—	—	—	8.91	—	1.84	0	12	12	4	14	n.	James E. Walters.
Monticello.....	Lawrence.....	209	6	74.5	—	96	3	44	22	36	9.12	—	2.52	0	17	13	5	12	se.	Dr. G. A. Teunissen.
Okolona.....	Chickasaw.....	311	25	72.8	— 1.7	99	3	44	22	34	6.87	+ 3.11	2.10	0	10	10	9	11	s.	E. J. Henson.
Pascagoula.....	Jackson.....	15	4	76.8	—	95	3	50	22	23	11.03	—	2.84	0	10	—	—	—	—	MoVea Young.
Pearlington.....	Hancock.....	10	25	75.8	— 1.7	94	3	48	22	29	10.43	+ 4.77	3.14	0	13	8	10	12	e.	Miss Annette Koch.
Porterville.....	Kemper.....	8	73.5	—	102	3	43	22	36	7.17	—	1.38	0	13	5	13	12	se.	I. S. Rea.	
Shubuta.....	Clarke.....	197	8	—	—	—	—	—	—	—	10.94	—	2.00	0	11	—	—	—	—	George A. Floyd.
Tupelo.....	Lee.....	278	14	73.9	—	100	3	40	22	34	6.70	+ 4.20	4.75	0	13	11	9	10	s.	W. S. Vincent.
Waynesboro.....	Wayne.....	191	26	73.7	— 1.8	97	3	43	22	37	10.67	+ 7.69	2.38	0	14	9	5	16	e.	R. S. Burke.
Woodland.....	Chickasaw.....	—	4	—	—	—	—	—	—	—	8.35	—	1.50	0	10	—	—	—	—	J. L. Ricks.

*, †, ‡, etc., indicate respectively 1, 2, 3, etc., days missing from the record.

** Temperature extremes are from observed readings of the dry bulb; means are computed from observed readings.

† Also on other dates.

T. Precipitation is less than 0.01 inch rain or melted snow.

